



Labels & Labs

By Dr. Margaret H. Whittaker and Dr. Ann Marie Gebhart

Performance or efficacy testing of green products is especially important in today's marketplace. Despite the massive growth in these types of products, purchasers of cleaning products often consider the green versions to be less effective and more expensive than their nongreen rivals. There is a lingering perception that green and organic products have a price premium that exceeds the incremental value of the environmental utility or health benefit. However, many green cleaning materials are no more expensive than the mainstream products and can be just as effective.

As green and natural eco-labels proliferate, so do doubts about efficacy and performance, as purchasers become increasingly confused by the wide array of labels and green marketing promises. Although the U.S. Federal Trade Commission's guidelines on green labeling specify some minimum requirements for claims, there is still abundant greenwashing and the use of hollow claims for green products. In addition, there are a number of meaningless eco-labels that require limited environmental, performance, or public-health requirements, resulting in the truly legitimate labels getting lost amidst the green fog.

Manufacturers use performance testing to ensure that environmentally preferable products perform effectively, resulting in product-marketing claims that are based on

objective and established criteria. Industry commonly defines performance testing as the process of exposing products to conditions that challenge the assumption that the product will meet a performance objective. Not only does performance testing assess how well a product functions, but also how long and how well it will function and under what conditions it operates.

Laboratory testing is used to ensure that a product meets minimum performance criteria for that type of cleaning product. Product performance is particularly important for green products, due to institutional-purchaser perceptions of elevated cost and inconsistent effectiveness. By backing up claims with objective evidence of product efficacy, institutional-purchaser fears can be addressed.

There are numerous product-efficacy standards designed to help identify important physical and chemical properties of cleaning products. These standards guide product manufacturers in the correct methods of formulating and testing their products to ensure quality and safe use. The more common performance standards include those of the American Society for Testing and Materials (ASTM) and the Consumer Specialty Products Association (CSPA).

Green Cleaners: Testing Basics

Examples of test methods available to manufacturers against which product performance can be evaluated include the following:

- ASTM G122-96—Standard Test Method for Evaluating the Effectiveness of Cleaning Agents
- ASTM D5343-06—Standard Guide for Evaluating Cleaning Performance of Ceramic Tile Cleaners
- ASTM E2274-03—Standard Test Method for Evaluation of Laundry Sanitizers and Disinfectants

These product-specific ASTM standards do not cover safety, however. Appropriate health and safety practices need to be established, along with determining regulatory compliance, prior to the assessment of product effectiveness.

As outlined in ASTM G122-96, a cleaning agent must be tested on a minimum of six test coupons to evaluate the capability of the cleaning agent. The cleaning parameters can be changed and the test method repeated to evaluate variations in cleaning-agent concentration; temperature; time, type, and strength of agitation; and other parameters, as based on the manufacturer's recommendations for the product. Control coupons are used to validate the testing procedure. A cleaning-effectiveness factor can then be calculated from the results of the testing on both the control and test coupons. The effectiveness factor indicates the fractional contaminant that was removed during cleaning. All data, as detailed in the standard, is carefully documented.

Is Testing a Requirement for Eco-Labels?

Most North American eco-labels for cleaning products—such as the U.S. Environmental Protection Agency's (EPA) Design for the Environment (DfE), Green Seal®, and EcoLogoM—specify performance requirements for certified/recognized products.

DfE performance-testing specifications—The EPA's DfE Criteria for Safer Cleaning Products (CSCP) establishes minimum requirements for identifying cleaning products that meet the DfE Safer Product Recognition Program criteria. This covers such cleaning products as glass cleaners, general-purpose cleaners, washroom cleaners, carpet cleaners, floor-care products, laundry detergents, graffiti removers, marine-cleaning products, and drain cleaners.

Manufacturers of products seeking DfE recognition must demonstrate that their products perform effectively, and to do this, they must submit appropriate test results, as specified in the DfE CSCP document, or provide equivalent performance tests agreed upon by the DfE.

Test methods for DfE-recognized products include various ASTM methods, CSPA methods, American Association of Textile Chemists and Colorists (AATCC) methods, and Canadian General Standards Board (CGSB) methods. Products must also undergo review for DfE recognition, which permits the use of the DfE logo on recognized products. At a minimum, cleaning-product manufacturers are required to submit the complete product-formulation information, intended function or end use of the product, MSDS sheets for ingredients when available,

pH of the finished product, concentrations, expected yearly production volume, environmental considerations in packaging, and the product-performance data.

Green Seal performance-testing specifications—Green Seal first published its standard for institutional cleaning products in 2000, and Green Seal Standard GS-37 (Cleaning Products for Industrial and Institutional Use) is a widely referenced environmental standard in the cleaning industry. Like DfE's CSCP, Green Seal also accepts a variety of efficacy tests from product manufacturers and allows companies to use internal performance-testing procedures for evaluation against competitive products in their class. For example, Green Seal requires that cleaning products clean common surfaces effectively as measured by comparison tests. The tested product is required to have a cleaning performance of at least 80 percent of the standard cleaning solution when diluted with water at room temperature as per the manufacturer's instructions. Data may also be accepted from efficacy testing conducted by the manufacturer under objective and reproducible laboratory conditions, which clearly demonstrate effective cleaning of common surfaces.

EcoLogo performance-testing specifications—EcoLogo was founded in 1988 by the Canadian government and is now widely used across North America, with 122 different standards (known as Certification Criteria Documents, or CCDs). EcoLogo has multiple standards for cleaning products, including floor-care products (CCD-147), hard-surface cleaners (CCD-146), hand cleaners (CCD-104), and carpet and upholstery cleaners (CCD-148). These standards cover a number of cleaning-product categories, including multipurpose

surface cleaners; floor and damp-mop cleaners; bathroom, toilet bowl, and tub and tile cleaners; glass cleaners; carpet and upholstery cleaners; heavy-duty cleaners and degreasers; laundry and dish detergents; disinfectants; graffiti removers; and deodorizing products. Products certified against an EcoLogo standard are required to have experimental data establishing that they perform effectively. Test methods for EcoLogo-certified products include various ASTM and CGSB methods, all of which are referenced in individual EcoLogo standards.

Testing Sites

Although many large companies have their own in-house laboratories available to perform performance testing following established protocols, smaller manufacturers may want to rely on outside laboratories to conduct testing. Laboratories that conduct testing against ASTM standards can be found by going to the ASTM online laboratory directory at www.astm.org/LABS/search.html and searching by the applicable ASTM test number. Section III of the CSPA's Cleaning Products Division Test Methods Compendium (fourth edition) lists testing laboratories that can perform testing according to specific CSPA performance standards, and CSPA's printed compendium can be ordered through its Web site (www.cspa.org). In addition, the nonprofit Toxics Use Reduction Institute Laboratory (TURI-Lab) at the University of Massachusetts-Lowell provides green cleaner performance testing, particularly for products evaluated against GreenSeal or DfE standards (www.turi.org/turi_lab).

Vital Validation

Formulating a cleaning product with an acceptable health and environmental profile

is just part of successfully developing a green cleaner. To ensure that your customers want to purchase your product on a repeat basis, it is critical for you to ensure that your product performs as well as or better than a conventional product.

Given the number of product-performance testing standards in existence, along with numerous eco-labels, the necessity to evaluate and verify a product's performance is ever growing in the market of cleaning and household products. For manufacturers of green cleaning products, this is especially important in order to gain a competitive edge over rival conventional products, as customers learn to recognize that the term "green cleaner" equates with "safe" and "works well"!

About the author

Dr. Margaret H. Whittaker and Dr. Ann Marie Gebhart are senior-level toxicologists with ToxServices, LLC and each have 20 years of experience evaluating products for compliance with published standards. They manage ToxServices' third-party review services provided to the EPA's DfE Safer Labeling Program and GreenBlue's CleanGredients Program. Ms. Kristen Schaefer is an associate toxicologist at ToxServices, LLC and specializes in assessing the safety and efficacy of green cleaning products.